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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,838	02/23/2004	Richard A. Johnson	1052-0199 (SILA:199)	1480
34456 7590 01/04/2007 LARSON NEWMAN ABEL POLANSKY & WHITE, LLP 5914 WEST COURTYARD DRIVE SUITE 200 AUSTIN, TX 78730			EXAMINER LE, LANA N	
			ART UNIT	PAPER NUMBER

2618

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/784,838	Applicant(s) JOHNSON, RICHARD A.	
	Examiner Lana N. Le	Art Unit 2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 13, 18-25, 27-46 is/are rejected.
- 7) ☒ Claim(s) 8-12, 14-17 and 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1, 5-6 and 29 are rejected under 35 U.S.C. 102(a) as being anticipated by the admitted prior art.

Regarding claim 1, the admitted prior art discloses a tuner (fig. 2) comprising:

a direct digital frequency synthesizer (82) having an output terminal for providing a digital local oscillator signal having a frequency chosen to mix a channel to a desired frequency; and a mixer (86) having a first input terminal for receiving a radio frequency signal (RF), a second input terminal coupled to the output terminal of the direct digital frequency synthesizer (84), and an output terminal for providing an output analog signal at a desired frequency (para. 6).

Regarding claim 29, the admitted prior art discloses a method of tuning comprising the steps of:

generating a digital local oscillator signal using a direct digital frequency synthesizer (82) having a frequency chosen to mix a channel to a desired frequency;
receiving a radio frequency signal (RF signal);

mixing (via 86) the radio frequency signal (RF signal) with the digital local oscillator signal to provide an analog output signal at the desired frequency, (fig. 2) (para. 6).

Regarding claim 5, the admitted prior art discloses the tuner of claim 4, wherein the radio frequency signal represents a radio band signal (para. 3, 6).

Regarding claim 6, the admitted prior art discloses the tuner of claim 5, wherein the radio band signal is an FM radio signal (para. 3).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Bugeja (US 7,016,654).

Regarding claims 2 and 30, the admitted prior art disclose the tuner and method of claim 1 and 29 respectively, wherein the admitted prior art does not disclose the desired frequency of the output signal is at baseband. Bugeja discloses a mixed output signal at baseband (figs. 1a & 1b; col 3, lines 20-37). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a mixed signal at baseband in order to have an RF and a baseband segment wherein power

consumption is scalable according to bandwidth utilized for saving power as suggested by Bugeja (col 1, lines 45-54).

5. Claims 3 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Cowley (US 2002/0,177,423).

Regarding claims 3 and 31, the admitted prior art disclose the tuner and method of tuning of claims 1 and 29 respectively, wherein the admitted prior art do not disclose the radio frequency signal (Rs) comprises a plurality of channels and wherein the desired frequency of the output signal is less than or equal to three channel widths. Cowley discloses the radio frequency signal comprises a plurality of channels and wherein the desired frequency of the output signal is less than or equal to three channel widths (para. 31). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the desired frequency be less than or equal to three channel widths in order to provide a low intermediate frequency signal to align the tuner onto a desired channel centered on a low intermediate frequency as suggested by Cowley.

6. Claims 4 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Birleson et al (US 6,177,964).

Regarding claims 4 and 32, the admitted prior art disclose the tuner and method of tuning of claims 1 and 29 respectively, wherein the admitted prior art do not specifically disclose the radio frequency signal comprises a plurality of channels and wherein the desired frequency of the output signal is greater than three channel widths. However, it is notoriously old and well known in the art to have the desired frequency be greater

than three channel widths as in high or regular intermediate frequencies as taught by Bireleson et al (col 8, lines 10-12). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the frequency be greater than three channel widths in order to convert the received RF signal to an appropriate intermediate frequency.

7. Claims 18, 20, 38, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Sakamoto (US 4,361,906) and further in view of Oosawa et al (US 2005/0,239,499).

Regarding claims 18 and 38, the admitted prior art disclose the tuner and method of tuning of claim 7 and 33 respectively, wherein the admitted prior art do not disclose the tuner comprises at least an additional receive path comprising: a second direct digital frequency synthesizer having an output terminal for providing a digital local oscillator signal having a frequency chosen to mix a channel to a desired frequency; and a second mixer having a first input terminal for receiving a radio frequency signal, a second input terminal coupled to the output terminal of the second direct digital frequency synthesizer, and an output terminal for providing a second output signal at a desired frequency. Sakamoto discloses a tuner comprises at least the additional receive path (56, 29, 48, 49-54, 31) comprising: a second direct digital frequency synthesizer (second PLL synthesizer; col 2, lines 45-58) having an output terminal for providing a digital local oscillator signal having a frequency chosen to mix a channel to a desired frequency; and a second mixer (48) having a first input terminal for receiving a radio frequency signal (W_{subRF}), a second input terminal coupled to the output terminal

of the second direct digital frequency synthesizer, and an output terminal for providing a second output signal at a desired frequency. Although Sakamoto do not disclose the second synthesizer is digital, it is well known and notoriously old in the art to have the synthesizer of Sakamoto digital as well in order to output digital oscillator signals in a complex domain. The admitted prior art and Sakamoto do not disclose one additional receive path on the single integrated circuit. Oosawa disclose one additional receive path on the single integrated circuit (para. 18; fig. 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to integrate the additional receive path in order to utilize a light and small multi band receiver with most of its functional components combined in an integrated circuit.

Regarding claims 20 and 40, the admitted prior art, Sakamoto and Oosawa disclose the tuner and method of tuning of claims 18 and 38 respectively, wherein Sakamoto discloses the first mixer (137, 143) and the second mixer receive a radio frequency signal in different frequency bands (col 9, lines 56-68).

8. Claims 19 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Sakamoto (US 4,361,906) and further in view of Oosawa et al (US 2005/0,239,499) and further in view of Yano et al (US 6,711,149).

Regarding claims 19 and 39, the admitted prior art, Sakamoto and Oosawa disclose the tuner and method of tuning of claims 18 and 38 respectively, wherein the admitted prior art, Sakamoto and Oosawa do not disclose the first mixer and the second mixer receive a radio frequency signal within the same frequency band. Yano et al disclose the two receivers receive a radio frequency signal within the same frequency

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band (col 11, lines 22-29). It would have been obvious to one of ordinary skill in the art at the time the invention was made to receive within the same band in order to allow the receiver to receive simultaneously from two different remote stations as suggested by Yano et al.

9. Claims 21, 25 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Sakamoto (US 4,361,906).

Regarding claims 21 and 41, the admitted prior art disclose the tuner and method of tuning of claim 7 and 33 respectively, wherein the admitted prior art does not disclose the radio frequency signal represents a television signal. Sakamoto et al disclose the RF signal represents a television signal (col 1, lines 40-43). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the tuner of the admitted prior art tune a television signal in order to tune to a desired TV channel for the user.

Regarding claim 25, the admitted prior art discloses the tuner of claim 7, wherein the admitted prior art does not specifically disclose the tuner comprising an oscillator having a clock signal as an output, the mixer being configured to receive the clock signal and the direct digital frequency synthesizer being configured to receive the clock signal through a divider. Sakamoto discloses a phase locked loop comprising an oscillator (25) having a clock signal as an output, a mixer (48) being configured to receive the clock signal and the direct digital frequency synthesizer (18-22, 30-31) being configured to receive the clock signal through a divider (26). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a

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clock signal in order to phase compare to lock the local clock source to the received timing information.

10. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Sakamoto (US 4,361,906) and further in view of Hedstrom (WO 97/06604).

Regarding claim 42, the admitted prior art and Sakamoto disclose the tuner of claim 41, where the admitted prior art and Sakamoto do not disclose the method where the desired frequency of the output signal is at baseband and further comprising converting the output signal from baseband to a predetermined center frequency utilizing a second digital local oscillator signal. Hedstrom discloses a method wherein the desired frequency of the output signal is at baseband (via 54, 58) and further comprising converting the output signal from baseband to a predetermined center frequency (via 132, 134) utilizing a second digital local oscillator signal.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to convert the output of the first and second mixers to a predetermined frequency in order to provide further conversion to a desired frequency to detect a stronger signal.

11. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Hedstrom (WO 97/06604).

Regarding claim 23, Stone et al disclose the tuner of claim 22, where Stone do not disclose the tuner comprising a converter circuit configured to convert the output signals

from the first and second mixers to a predetermined center frequency. Hedstrom discloses a converter circuit (132, 134) configured to convert the output signals from the first and second mixers (54, 58) to a predetermined center frequency. It would have been obvious to one of ordinary skill in the art at the time the invention was made to convert the output of the first and second mixers to a predetermined frequency in order to provide further conversion to a desired frequency to detect a stronger signal.

12. Claims 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Staszewski et al (US 2003/0,083,033).

Regarding claim 34, the admitted prior art disclose the method of claim 29, wherein the admitted prior art do not disclose the mixing step comprises converting the radio frequency signal to at least one current signal; and mixing the at least one current signal with the output from the direct digital frequency synthesizer. Staszewski et al disclose a method for converting the radio frequency signal to at least one current signal and mixing the at least one current signal with the output from the direct digital frequency synthesizer. (para. 52, 101; figs. 11a, 14). It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the mixer of Stone et al with the mixer of Staszewski et al in order to reduce power consumption by generating clock signals that can be shared by the different signal paths.

Regarding claim 35, the admitted prior art and Staszewski et al disclose the method of claim 34, wherein Staszewski disclose the radio frequency signal, the current signal, and the output signal comprise differential signals (para. 73; figs. 11a, 14).

Regarding claim 36, the admitted prior art and Staszewski et al disclose the

method of claim 34, wherein Staszewski et al disclose the converting step comprises generating a plurality of current signals using a plurality of transconductor cells (para. 101; fig. 14).

13. Claims 13, 22 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Stone et al (5,251,218).

Regarding claims 13 and 37, the admitted prior art discloses the tuner and method of tuning of claim 1 and 29 respectively, wherein the admitted prior art does not disclose the direct digital frequency synthesizer further comprises an input terminal for receiving a tuning signal corresponding to a desired channel and is configured to provide the digital local oscillator signal at a frequency determined at least in part by the tuning signal. Stone et al disclose the direct digital frequency synthesizer (111) further comprises an input terminal for receiving a tuning signal (control input) corresponding to a desired channel and is configured to provide the digital local oscillator signal (cos, sin outputs) at a frequency determined at least in part by the tuning signal (col 5, lines 32-41). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the synthesizer of the admitted prior art have an input signal in order to provide a signal indicative of a selected channel to be tuned as suggested Stone et al.

Regarding claim 22, the admitted prior art discloses the tuner of claim 21, wherein the admitted prior art does not disclose the tuner further comprising a second mixer having a first input terminal for receiving the radio frequency signal, a second input terminal, and an output terminal for providing a quadrature signal, wherein

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the direct digital frequency synthesizer further has a second output terminal coupled to the second input terminal of the second mixer for providing for providing a phase-shifted digital local oscillator signal. Stone et al disclose a second mixer (121) having a first input terminal for receiving the radio frequency signal (Rs), a second input terminal (input terminal to receive signal from 111), and an output terminal for providing a quadrature signal (Q), wherein the direct digital frequency synthesizer (111) further has a second output terminal coupled to the second input terminal of the second mixer (121) for providing for providing a phase-shifted digital local oscillator signal (sin LO output) (figs. 1 & 3). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a second mixer coupled to the synthesizer in order to downconvert the RF signal to a complex domain baseband signal as suggested by Stone et al.

14. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over The admitted prior art (US 5,251,218) in view of Hedstrom (WO 97/06604) and further in view of Birleson et al (US 6,177,964).

Regarding claim 24, the admitted prior art and Hedstrom disclose the tuner of claim 23, wherein the admitted prior art and Hedstrom do not disclose the tuner further comprising a second direct digital frequency synthesizer having an output coupled to the converter circuit. Birleson et al disclose a second direct digital frequency synthesizer (32) having an output coupled to the converter circuit (204). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a second synthesizer in order to separately control the local oscillator inputs.

15. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over The admitted prior art in view of Tomasz et al (US 2001/0,041,532) and further in view of Sakamoto (US 4,361,906).

Regarding claim 43, the admitted prior art, Tomasz et al disclose the method of claim 33, wherein the admitted prior art and Tomasz et al do not disclose the method further comprising providing a reference clock signal and utilizing the reference clock signal in the generating and mixing steps. Sakamoto disclose the method comprising providing a reference clock signal (from reference oscillator 25) and utilizing the reference clock signal in the generating and mixing steps (col 2, lines 45-58). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a reference clock signal in order to phase compare to lock the local clock source to the received timing information.

16. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over The admitted prior art in view of Sakamoto (US 4,361,906) and further in view of Staszewski et al (US 2003/0,083,033).

Regarding claim 44, the admitted prior art and Sakamoto disclose the method of claim 43, wherein the admitted prior art and Sakamoto do not disclose the mixing step comprises converting the radio frequency signal to M current signals, generating an M-bit digital signal from the digital local oscillator signal, and mixing the M current signals with the M-bit digital signal to provide the output signal at the desired frequency.

Staszewski et al disclose a mixing step comprises converting the radio frequency signal to M current signals, generating an M-bit digital signal from the digital local oscillator

signal, and mixing the M current signals with the M-bit digital signal to provide the output signal at the desired frequency (para. 52, 101; figs. 11a, 14). It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the mixing of the admitted prior art with the mixing of Staszewski et al in order to reduce power consumption by generating clock signals that can be shared by the different signal paths.

17. Claims 7, 27-28, 33, 45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Tomasz et al (US 2001/0,041,532).

Regarding claims 7 and 33, the admitted prior art disclose the tuner and method of tuning of claims 1 and 29 respectively, wherein the admitted prior art does not disclose the direct digital frequency synthesizer and the mixer are combined in a single integrated circuit. Tomasz et al disclose the direct digital frequency synthesizer (500) and the mixer (124, 126) are combined in a single integrated circuit (120); (fig. 7; para. 22). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the mixer and synthesizer combined in an integrated circuit in order to reduce the size of the downconverter circuit for compactness.

Regarding claims 27 and 45, the admitted prior art and Tomasz et al disclose the tuner and method of tuning of claims 7 and 33 respectively, wherein the admitted prior art disclose the radio frequency signal represents a radio band signal (para. 3, 6).

Regarding claims 28 and 46, the admitted prior art and Tomasz et al disclose the tuner and method of tuning of claims 27 and 45 respectively, wherein the admitted prior art discloses the radio band signal is an FM radio signal (paras. 3, 6).

Response to Arguments

18. Applicant's arguments with respect to claims 1-46 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

19. Terminal disclaimers have been filed to overcome the double patenting rejection filed 6/05/06.

20. Claims 8-12, 14-17, and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lana N. Le whose telephone number is (571) 272-7891. The examiner can normally be reached on M-F 9:30-18:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F. Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Lana Le


11-20-06

LANA LE
PRIMARY EXAMINER